In Reply
Refer To: H-6-3

June 25, 1991

Mr. William Benak, President
Levin Richmond Terminal Corporation
1800 Monterey Highway
San Jose, CA 95112

Re: Comments on Feasibility Study Report for the United Heckathorn Superfund Site

Dear Mr. Benak:

Enclosed are comments on the Feasibility Study for the United Heckathorn Superfund Site, prepared by Levine-Fricke on January 11, 1991. Although the work done to date is not sufficient to support a determination of a final remedy for the site, it does provide a substantial foundation for the completion of the Remedial Investigation/Feasibility Study (RI/FS) phase.

The comments which follow focus on those areas of the RI/FS which will require expansion or revision in order to fulfill the requirements of CERCLA and the NCP. It is our intention to perform the Risk Assessment portion of the RI/FS, and to negotiate with all Potentially Responsible Parties to complete the remaining studies on consent.

1. Site Description.

The Feasibility Study addresses Levin's property upland and in the Lauritzen Channel. However, CERCLA (101(9)) defines a facility to include all areas where contamination has come to be located. Other areas of known contamination include the Parr Canal and the Santa Fe Channel. The Department of Health Services' July 29, 1987 Remedial Action Order stated that the Levin Metals yard is on another portion of the original property which has never been investigated for possible contamination problems. Aerial photographs from the 1950's show facilities and tanks on the property to the east of 4th Street, which must be identified to determine whether they were used in connection with pesticide operations at the site.

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DATE	6/25/91	6/25/91	6/27/91			

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, Ca. 94105

In Reply
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June 27, 1991

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Levin Richmond Terminal Corporation
1800 Monterey Highway
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Enclosed are comments on the Feasibility Study for the United Heckathorn Superfund Site, prepared by Levine-Fricke on January 11, 1991. Although the work done to date is not sufficient to support a determination of a final remedy for the site, it does provide a substantial foundation for the completion of the Remedial Investigation/Feasibility Study (RI/FS) phase.

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1. Site Description.

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2. Extent of Contamination.

In order to complete the Remedial Investigation, the areal extent and the depth of contamination must be determined so that total volumes of contaminated soils and sediments at varying ranges down to zero can be estimated. This information is necessary for evaluating cleanup alternatives.

Existing information on the depth of sediment contamination, in particular, is lacking. For example, the FS proposes dredging the northern end of Lauritzen Channel to 8 feet. However there does not appear to be sufficient data to ensure that exposed sediments will be uncontaminated after dredging to that depth. The RI contains only one sample within the area proposed for dredging to 8 feet, with total DDT concentrations of roughly 20 ppm at a depth of 6 inches, and roughly 50 ppm at 24 inches. Harding Lawson's 1986 Remedial Action Plan contains more data at greater depths, but it is also not sufficient to determine a remedial depth. Similarly, the depth to clean sediment in the Santa Fe Channel must be determined and the contamination of the Parr Canal must be characterized.

Finally, The Department of Health Services Environmental Epidemiology and Toxicology Branch has expressed concern that the United Heckathorn facility, when operating, may have released significant amounts of hazardous materials into the air and into surrounding neighborhoods. Therefore, as part of the final RI/FS, the potential contamination of nearby areas will need to be assessed.

3. Risk Assessment.

As stated in the Remedial Investigation Report, the public health evaluation is not a quantitative risk assessment. EPA intends to perform a baseline risk assessment for the site which will be part of the final RI/FS. EPA does not agree that the public health evaluation "provides sufficient information to develop remedial action objectives and appropriate remedial alternatives for the site." Significant areas of disagreement with the Public Health Evaluation include the following:

i) Upland: Soil and groundwater pathways have been screened out from the risk analysis because of restricted site access. While public access may be restricted, workers at the site have been exposed in the past and may be in the future. Workers using torches were adversely affected by pesticide residues in 1983, and workers discovered high levels of pesticides and chlorinated organic solvents when excavating for the train scale in 1986. Extremely hazardous levels of dieldrin and endrin remain on-site. Construction work in the future, such as dock and rail maintenance or excavation could pose significant risks. We do not agree with

the report's conclusion that all alternatives presented (with the exception of no action) are protective, since it is unlikely that alternatives which simply cap all contaminated soils will protect workers.

ii) Marine: A major focus of the risk assessment will be an examination of the fish and shellfish consumption pathway. The San Francisco Bay Basin Plan (Chapter II, December, 1986) designates the beneficial uses of Bay waters. Richmond Harbor and all waters around the site, including the Lauritzen Channel, are part of the Central Bay under the Basin Plan. The beneficial uses of these waters include shellfish harvesting and commercial and sport fishing, and other uses, in addition to navigation. The use of the Harbor Channels for shipping and the zoning of adjacent lands for port-priority use do not limit Basin Plan designated beneficial uses of the waterbodies. Similarly, the fact that the Lauritzen Channel has been posted to discourage fishing does not limit such beneficial uses. The baseline risk assessment will determine the carcinogenic risk and non-carcinogenic hazard associated with the consumption of contaminated organisms, using exposure assumptions appropriate to uses designated under the Basin Plan.

iii) Ecological Assessment: EPA also intends to perform the ecological portion of the risk assessment. This will likely include bioaccumulation studies, edible tissue contamination studies, analyses of sediment characteristics including pore water contamination, sediment toxicity tests, and benthic surveys.

4. Cleanup Levels.

(i) Marine Sediments: The basis for the channel sediment remediation level is inappropriate. Since the goal of the clean-up is protection of human health and the environment, the remedial level cannot be based on the level of regional pollution, which has no relationship to such protection. In addition, Harding Lawson's limited investigation of Parr Canal sediments indicated DDT concentrations up to 9 ppm. Levine-Fricke's investigation of the Santa Fe Channel indicates average contamination of 0.4 ppm. If the Lauritzen Channel is dredged to a level of 0.2 ppm, as recommended in the FS, or to a lower level, this will still leave a large area of Richmond Harbor contaminated above the remediation level.

Two basic criteria must be established to determine a clean-up level. The first is the level which will cause no chronic toxicity to aquatic organisms, including benthic organisms. The second is the level which will prevent bioaccumulation to levels harmful to human or animal consumers of aquatic organisms. The more stringent of these two criteria will determine the sediment clean-up level for the site.

In addition to the inappropriate basis of the remedial level proposed in the FS, the value presented for regional peripheral waterway contamination is erroneous. First, all of Levine-Fricke's RI data is presented as sediment wet weight. The 0.2 ppm contamination level, however, is taken from NOAA's May, 1988, Status and Trends Report (NOS OMA 41), which expresses contaminant levels as dry weight. Converting this value to wet weight for comparison to Levine-Fricke's data reduces it by roughly one-half. In addition, the NOAA data base contains various high values which skew the result. For example, the Navy reported non-detectable results for all analyses at Treasure Island. However the detection level reported for some of the data was very high - 600 ppb. For the purposes of NOAA's calculations, the non-detectable values were assumed to be one-half the detection limit, or 300 ppb. This results in a calculated average that is very likely higher than the true value.

The FS states that the clean-up level is defined in terms of DDT because it has been detected at higher levels and over a larger area than other pesticides. While this is correct, the long-term demonstration that the clean-up has been successful must address both DDT and dieldrin. Despite the fact that dieldrin levels are generally two orders of magnitude below the DDT levels, and therefore non-detectable in many samples, there is significant dieldrin bioaccumulation in site waters. Long-term monitoring of tissue residues will be necessary to determine whether the sediment clean-up has been successful in protecting human health and the environment from both DDT and dieldrin.

(ii) Soils: The remedial action objective presented in the Feasibility Study for soils is 1 ppm. The 1 ppm objective is misleading however, because it is not used as the objective for any alternative besides capping. Although the FS states that, "the remedial alternatives presented in Section 4 include on-site containment and/or off-site treatment and disposal options to meet the above objectives," a much higher level is actually used in the analysis of treatment and removal alternatives.

For incineration, the remediation level is described on page 62 as "very high chlorinated pesticide concentrations, which could not be disposed of in a landfill without treatment." The level of DDT listed hazardous waste which can be landfilled without treatment after May 8, 1992 is 0.087 ppm under RCRA. Given a CERCLA treatability variance, the level could possibly be as high as 10 ppm. However, on page 118, the alternative of off-site disposal is evaluated only for soils with "chemical concentrations greater than 1,000 ppm." This is two to five orders of magnitude higher than the level which could be disposed of in a landfill without treatment. The final cleanup level for upland soils will be developed in EPA's baseline risk assessment for the site.

(iii) Embankment: The cleanup level proposed for the embankment is the same as that for the upland soils: 1 ppm. However, the definition of the embankment in the Feasibility Study seems to sometimes include both exposed and submerged areas, and at other times to only include areas above water. The potential human and environmental risks for submerged areas of the embankment and the channel bottoms are probably the same, as are the risks for exposed portions of the embankment and upland areas. Therefore it would seem reasonable to apply the marine sediment cleanup level to submerged areas of the embankment, and the soils cleanup level to exposed areas.

5. Applicable, Relevant and Appropriate Requirements.

EPA has requested reviews of the ARARs discussion of state laws from DHS, RWQCB2, and BCDC. EPA is particularly concerned about the following aspects of the ARARs discussion of federal laws.

i) Ambient Water Quality Criteria. EPA's Ambient Water Quality Criteria for the protection of human health from the consumption of contaminated aquatic organisms are ARARs since the designated beneficial uses of Central Bay waters include shellfish harvesting and fishing.

ii) Endangered Species Act. The California Brown Pelican is an endangered species. Two Brown Pelicans were observed feeding at the site by EPA and Levine-Fricke employees on November 6, 1990.

iii) Resource Conservation and Recovery Act. In the ARARs discussion of RCRA (Section 2.2), the FS states:

> "EPA has promulgated regulations under 40 CFR 264 for permitted hazardous waste disposal facilities. DHS has promulgated regulations under CCR Title 22, Article 29 for landfills. Portions of these regulations would be ARARs for the disposal of soils which are RCRA wastes. Details of these ARARs are discussed in Section 4.2 (Detailed Analysis of Alternatives)."

The discussion of ARARs in Section 4.2 however, is limited to the assertion that all alternatives would be expected to comply with ARARs identified in Section 2.2. In the final FS, it will be necessary to analyze RCRA and state requirements for disposal facilities containing hazardous wastes. In addition, floodplain requirements should be addressed for facilities constructed in submerged areas.

6. Alternatives Screening and Analysis.

The final FS will address remediation throughout the area of contamination, including the Santa Fe Channel, Parr Canal, and possibly the Richmond Inner Harbor. This will affect the analysis of alternatives for remediation of the Lauritzen Channel. In addition, the following are comments concerning the analysis of alternatives presented in Levine-Fricke's FS for the Lauritzen Channel.

In the screening section, a wide range of alternatives should be identified and then screened for effectiveness, implementability, and cost. The result of the screening should be a number of distinct options and alternatives. The FS however, inappropriately screens out many options, and fails to consider other options. The result is not a range of distinct action options, but variations of one option, all of which include construction of a steel sheetpile wharf along the Levin Terminal, and confined waste disposal within the Lauritzen Channel.

Examples of alternatives which have been inappropriately eliminated include upland disposal at the Parr Canal property, and disposal in the Port of Richmond graving docks. Disposal at the Parr Canal property was screened out because "of the requirement to obtain a hazardous waste land disposal facility permit for the Parr Canal property, and the institutional problems associated with this permitting requirement." The need to obtain a permit is not a justification for eliminating an alternative. Furthermore, the Parr Canal property appears to be part of the area of contamination of United Heckathorn. Thus, permits would probably not be needed for disposal at this location. The need to obtain permits or other agreements to use the graving docks for disposal is also not an appropriate justification for eliminating this alternative.

A range of alternatives, including removal and capping, should be analyzed for contaminated submerged embankment sediments. Although the FS purports to consider excavation, it is limited to areas above the water without justification. Only one alternative, construction of a sheetpile wall, is presented for submerged sediments. This results in the $7 million cost of the sheetpile wall appearing as part of all the action alternatives, including the off-site disposal alternative.

The area necessary for settling and dewatering of dredged materials for upland or off-site disposal must be discussed in order to evaluate it as an alternative. The FS states: "These activities may need to be staged over a period of several years or more, because of the limited on-site area available to treat and/or dispose of the dredged sediments." Further on in the alternatives analysis (p. 120), it is estimated that area limitations would permit only 9,000 cubic yards of dredging per year, requiring four years to complete the process. The basis of these assumptions and

limitations, such as which upland areas have been considered "available," must be presented so that alternatives can be reasonably analyzed.

Enclosed are additional comments from the National Oceanic and Atmospheric Administration and the Regional Water Quality Control Board. Comments have also been requested from the Department of Health Services, and the Bay Conservation and Development Commission. If you have any questions concerning this matter, please contact me at (415) 744-2240.

Sincerely,

Andrew Lincoff
Remedial Project Manager

Enclosures

cc: Ted Park
Susan Gladstone
Keith Howard
Alan Leavitt

STATE OF CALIFORNIA PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
2101 WEBSTER STREET, SUITE 500
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464-1255

April 15, 1991
File No. 2119.1091(sfg)

Andy Lincoff
US Environmental Protection Agency
75 Hawthorne Street
San Francisco, CA 94105

Subject: **Feasibility Study Report for the United Heckathorn Site**

Dear Andy:

Staff of the Regional Water Quality Control Board (RB) have reviewed the subject document prepared by Levine-Fricke and dated January 11, 1991. We have concerns pertaining to Section 2.2 "Applicable or Relevant and Appropriate Requirements" (ARAR) and to Section 3.0 "Screening of Technologies."

With respect to surface water quality objectives (Section 2.2.2.2), we would like to clarify that the Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) should be evaluated as an ARAR. Although numeric standards for the indicator chemicals for the site have not been established, current and beneficial uses of the adjacent Bay waters must be evaluated and considered in this process. This includes any potential migration and effects of polluted ground water to surface waters, whether or not the ground water quality meets drinking water criteria.

Section 2.2.5.2 has identified the State Water Resources Control Board Resolution (SWRCB) 68-16 "Statement of Policy with Respect to Maintaining High Quality Waters in California" as a To-Be-Considered requirement. For protection of surface and ground waters, this policy meets the definition of an ARAR (SWRCB memo dated July 30, 1990) and must be evaluated as such.

Additionally, we find that initial screening of some of the technologies outlined in Section 3.0 is incomplete in terms of evaluation for effectiveness and implementability. We recommend an in-depth effort be made to screen technologies and provide clear justification as to why they may or may not meet the criteria.

Finally, we would also like to point out that ground water investigation for this site is incomplete. Previous ground water data was collected during the 1983 to 1986 investigation phases and tDDT was detected in the ppb range in at least nine wells, as were several VOCs. The wells could not be located for resampling during the October 1989 upland sampling effort. We feel that current

ground water data is important to the overall evaluation of remedial alternatives; the Regional Board may also require long term ground water monitoring to measure the effectiveness of remediation.

Please call me if you have any questions regarding these comments. I can be reached at 415-464-0840.

Sincerely,

Susan Gladstone

Susan Gladstone
Environmental Specialist
Toxics Cleanup Division

U.S. DEPARTMENT OF COMMERCE
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27 June 1991

Andy Lincoff
Manager United Heckathorn Remedial Project, US EPA
Hazardous Waste Management Division, OHEP (H-6-3)
75 Hawthorne Street
San Francisco, CA 94105

Ref: Review of Feasibility Study Report United Heckathorn Site, Richmond, California.

Dear Mr. Lincoff:

The U.S. Department of Commerce/National Oceanic and Atmospheric Administration (NOAA) appreciates the opportunity to review and comment on the "Feasibility Study Report United Heckathorn Site, Richmond, California" (dated 11 January 1991) as prepared by Levine-Fricke.

The Feasibility Study (FS) addresses remedial action objectives (RAOs) and alternative clean-up actions for soils, sediments, surface water, groundwater, and air at the United Heckathorn site. DDT (total) was considered the contaminant of concern. A target clean-up level of 1,000 µg/kg total DDT was proposed for remediation of upland soils and the embankment sediments. Sediments with concentrations greater than 200 µg/kg total DDT were proposed to be remediated in Lauritzen Canal.

A number of remedial actions have been proposed for the site including "no action," use restrictions (*e.g.*, limited site access), removal (*e.g.*, dredging) and disposal (*e.g.*, on-site or off site), containment (*e.g.*, capping or horizontal barriers), and treatment (*e.g.*, chemical stabilization). Post-remediation environmental monitoring was proposed for most alternatives. Several remedial actions emerged as the preferred alternatives by the PRP. Specifically, containment of sediments behind a steel sheet pile wall along the east bank of the canal and behind a sheet pile and rock dam at the head of the canal was proposed to remediate the intertidal embankment and subtidal sediments in Lauritzen Canal. Capping was the preferred action for the upland site.

In general, the environmental evaluation component is inadequate in both depth and scope. The proposed characterization of the marine habitat which has been contaminated is not comprehensive, and the derivation of target clean-up level of 200 µg/kg for total DDT in marine sediments was flawed both technically and conceptually. Specific comments follow.

The remedial action objective of 200 µg/kg DDT was proposed for clean-up of Lauritzen Canal sediments based on a calculated "background level" for DDT in San Francisco Bay. The data used to derive the "background concentration" were from a NOAA's Status and Trends Technical Memorandum, "Status and Trends in Concentrations of Contaminants and Measures of Biological Stress in San Francisco Bay", of which I am a co-author. Levine-Fricke used an arithmetic mean DDT value for peripheral areas of San Francisco

Bay, excluding Lauritzen Canal, as reported in our Tech Memo. This value (actually 190 µg/kg dry weight) was taken by Levine-Fricke to represent the bay-wide, general "background" level of contamination by DDT.

It is important to note that the approach used to calculate the arithmetic mean value presented in our tables [$(x_1 + x_2 \ldots\ldots + x_n)/n$] is not an accurate statistical representation of the measure of central tendency of DDT concentrations, as clearly stated in our Tech Memo. This approach assumes that the data are normally distributed and the mean is the best measure of the central tendency or where most of the data points fall. Environmental data in general and chemistry data in particular, usually violate this assumption (*i.e.*, these data have some other type of distribution). And the DDT data for San Francisco Bay are in fact obviously skewed towards a log distribution. Because the data are skewed, the best estimate of central tendency is represented by the median (if the data are ranked by concentration, the median is the concentration at which half the observations are above it and half are below it). This fact was also explicityly stated in our report, and median values were presented in the tables used by Levine-Fricke. When the median is used as a representation the "background" level of contamination in peripheral areas of the bay, a target clean-up level of 23 µg/kg would be derived.

However, another highly contaminated area (*i.e.*, the Berkeley Marina) was included in the data set we used within our report, which had the effect of raising the resulting median value. If this one other obvious DDT "hot spot" in San Francisco Bay is excluded and a new "background" level recalculated, the end result drops to 20 µg/kg DDT.

Furthermore, as was stated repeatedly in our Tech Memo, contaminants are widespread in biota and sediments throughout the San Francisco Bay system. All areas sampled within the bay thus far have been impacted to some degree by anthropogenic contaminant sources (*i.e.*, elevated above coastal reference). However, a general pattern towards elevated levels in peripheral areas of the bay *versus* the main basins was observed for numerous contaminants, including DDT. Given this fact, a more accurate indication of an overall, regional "background" level of contamination by DDT would in fact be the median for the main basin portions of the San Francisco Bay system. This value, also clearly stated in our Tech Memo, was 3 µg/kg DDT.

So far this discussion has revolved merely around the proper arithmetic representation of a "background" level of DDT in sediments. However, a purely arithmetic approach to determining target clean-up levels does not account for environmental fate and effects of DDT, and is not an acceptable approach to NOAA. Target clean-up levels must be protective of the natural resources, and as such, incorporate existing information regarding the toxicity of DDT.

If an effects-based approach to evaluate the proposed RAO for sediments in Lauritzen Canal is used, 200 µg/kg DDT is clearly unacceptable since it is higher than most values reported to have an effect, as cited in Long and Morgan (1990). Of the studies reporting adverse effects associated with DDT cited by Long and Morgan, half the effects observed or predicted occurred at total DDT concentrations above 222 µg/kg. The lower end of the spectrum for bioeffects due to DDT exposure, as represented by the 10^{th} percentile, is 3 µg/kg. Using reported toxicity data from spiked sediment *Crangon* bioassays, the LC_{50} for total DDT was reported at 20 and 30 µg/kg in Long and Morgan's report. In addition, the San Francisco AET for 4,4'-DDT is approximately 10 µg/kg. So, based on effects, an RAO an order of magnitude lower than that proposed (20 µg/kg *versus* 200 µg/kg DDT) is probably justifiable and would be much more protective of aquatic resources.

Other deficiencies were noted in the FS document. Currently, the FS addresses only remediation of soils at the main United Heckathorn site and only sediments in Lauritzen Canal. Using even the 200 µg/kg total DDT clean-up level for sediments proposed in the FS and data presented in the FS for DDT levels in Santa Fe Channel, it would be required that some areas within the Santa Fe Channel also be remediated since the proposed target level was exceeded at several sites within this channel. This fact must be made explicit. In addition, Levin Enterprises (parent company of LRTC) also owns the upland areas bordering Parr Canal which were used for disposal of contaminated sediments from Lauritzen Canal during the 1960's. This site needs to be addressed in the FS for any remedial actions proposed for the United Heckathorn site.

The extent of contamination outside of Lauritzen Canal was not well documented. Numerous existing studies have indicated that DDT concentrations are elevated in sediments in Harbor Channel and inner Richmond Harbor. This elevation may be due to sediment transport from Lauritzen Canal. For the purpose of planning and designing any remediation, the magnitude and extent of chlorinated pesticide contamination in channels hydraulically connected to Lauritzen Canal needs to be documented.

Also, a minor misrepresentation (page 24) concerning FDA limits was noted. The FS listed FDA limits as "health protective". This is not wholly accurate, as FDA admits their criteria must take into account other factors including the resultant economic implications.

To minimize any future problems with contaminants at the United Heckathorn site, it is recommended that permanent remedial actions be pursued. Given that United Heckathorn may have contributed up to 30 percent of the DDT contamination presently found in San Francisco Bay sediments, it is important to remove this site as a source. Currently, the upland area is capped with gravel to prevent wind erosion and transport of contaminated soils. It would be preferable that a permanent, impervious capping material be put in place over the upland site. This will prevent both aerial and groundwater transport of chlorinated pesticides away from the site.

The information presented in the FS was inadequate to evaluate the effectiveness of the proposed remedial actions for the intertidal and subtidal sediments. Proposed remediation of sediments includes construction of a sheet pile wall backed with geotextile material along the toe of the east bank. This wall would be backed-filled with sediments dredged from Lauritzen Canal. In addition, a combination sheet pile/rock dam backed with geotextile material would be built at the head of the canal. Contaminated sediments at the head of the canal would be left in place behind the dam. Less contaminated sediments from the canal would be dredged to fill in the area behind the dam. Use of geotextile material assumes that some water movement will occur across the barrier. This material essentially acts as a filter. In order for it to work properly, the pore size of the material must be small enough to retain sediments without plugging and large enough to allow passage of water. Sediment grain size characteristics of the dredge disposal material must be measured prior to designing any barriers.

Use of pervious materials to form a barrier along the eastern shoreline assumes that groundwater transport is not a major pathway of offsite migration. However, DDT was detected at levels 1000 times greater than marine chronic Ambient Water Quality Criteria (AWQC) (Sampson *et al.* 1990) in groundwater at the site. Unfortunately this issue is complicated by the lack of characterization of groundwater movement at the site. Capping of the upland site with impervious materials would tend to prevent potential leaching of contaminants into the groundwater by percolation of rainwater. Yet, it is likely that groundwater is influenced by tidal movement and flows from upgradient areas. If contaminated sediments extend into the groundwater layer, tidal pumping may enhance

leaching of the contaminants that might not otherwise occur. In addition, back filling the wall with dredge disposal material from the canal may exacerbate leaching by tidal pumping of groundwater. Given that mean DDT levels in sediments of Lauritzen Canal are four orders of magnitude greater than interim EP sediment guidelines, containment of contaminated sediments behind a permeable barrier would be predicted to be a chronic source for leachate above the AWQC for the protection of aquatic life. This remedial alternative would obviously be unacceptable for the protection of NOAA resources.

Any dredging of contaminated sediments is likely to have deleterious impacts during the actual dredging events due to resuspension of contaminated sediments. Selection of dredging equipment and procedures, particularly dewatering, should seek to minimize any impacts of this nature.

Last but not least, it is the intent of Superfund to find permanent solutions to contaminant problems. The PRP-preferred remedial actions for the site are not necessarily permanent solutions. On-site contaminant containment may not be the best or most environmentally protective alternative in the long run. Further loss of habitat by on-site sediment containment would require extensive justification plus a greater level of mitigation for habitat degradation.

If you have any questions about these comments or require further explanation or elaboration, I can be reached *via* 744-3126 or in my Seattle office at FTS 392-6340

Sincerely,

Michael Buchman
Acting Coastal Resources Coordinator

References

Levine-Fricke. 1990. Remedial Investigation United Heckathorn Site, Richmond, California. Prepared for Levin Richmond Terminal Corporation, Richmond, California. Prepared by: Levine-Fricke, Emeryville, CA.

Long, E.R. and L.G. Morgan. 1990. The potential for biological effects of sediment-sorbed contaminants tested in the National Status and Trends Program. NOAA Technical Memorandum. NOS OMA 52. U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Ocean Service. Coastal and Estuarine Assessment Branch. Rockville, Maryland. 175 pp + Appendices.

Sampson, J., J. Greene, P. Booth, D. Johns, T. Peterson, and M. Huguenin. 1990. Levin Richmond Terminal Corporation Scientific and Economic Assessment. Draft Report. Prepared for: U.S. Department of Commerce. National Oceanic and Atmospheric Administration. National Ocean Service. Office of Oceanography and Marine Assessment. Ocean Assessments Division. Rockville, Maryland. Prepared by E.V.S. Consultants, Seattle, Washington and 53 pp.